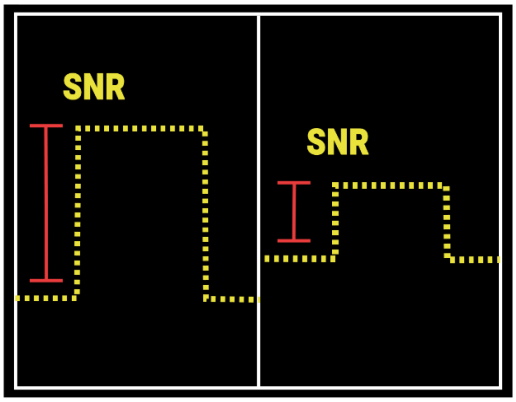
Programmable AWGN Generator & RF Power Measurement

Applications demanding increased data rates and higher operating frequencies must manage rising noise floors from communications sources like 5G, Wi-Fi, and satellite signals. The signal-to-noise ratio (SNR) and carrier-to-noise (C/N) ratio can quantify a system's tolerance to complex noise, providing insight into its real-world performance. Maury Microwave showcases how controlled additive white Gaussian noise (AWGN) can ensure the performance designed in the lab is realized in the field.

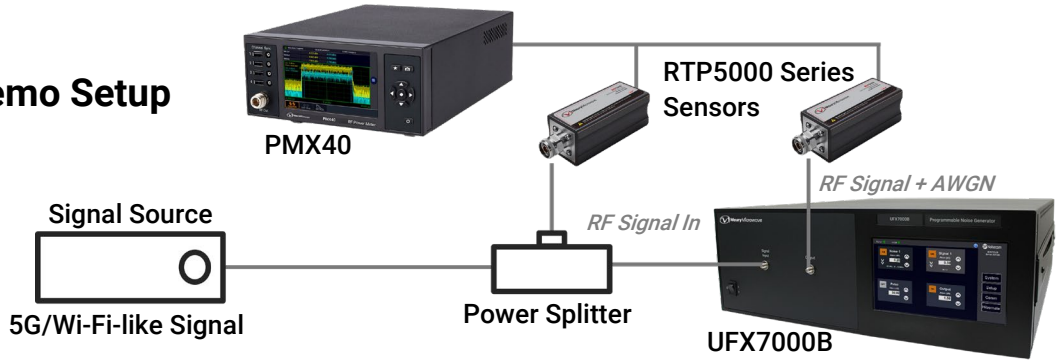


Precision SNR and C/N manipulation.

The demonstration first monitors the 5G/Wi-Fi-like output from a signal source with a Maury Microwave RTP5000 Series Real-Time USB Peak Power Sensor. The signal is then fed into the Maury Microwave UFX7000B Programmable AWGN Generator, which enables manipulation of the carrier signal and noise floor in 0.1 dB steps over a 127 dB dynamic range. An RTP5000 sensor is the receiver that captures the UFX7000B signal + noise output and measures the SNR and C/N power envelope in real time. The UFX7000B can have additional CW and band-limited noise via internal or external filters for more complex interference.

The RTP5000 sensors are connected to the Maury Microwave PMX40 RF Power Meter with advanced measurement capabilities. The PMX40 enables multiple measurements between user-controlled markers and provides a benchtop experience that incorporates touchscreen operation with USB sensor flexibility.

Demo Setup



Target Users

Target users include design and test engineers working with wireless communications systems, satellite networks, and radar systems that need to know how broadband noise impacts their receiver. For rackmount systems with limited space, the Maury Microwave RFX7000B Programmable AWGN Generator offers a compact form factor solution.

Product Overview

UFX7000B Programmable Noise Generator

The UFX7000B has a powerful single board computer with a flexible architecture used to create complex custom noise signals for advanced test systems. Offering both remote and manual control capabilities, the instrument's precision components provide high output power with superior flatness while the flexible architecture allows control of multiple attenuators, switches, and filter banks.

KEY SPECIFICATIONS AND FEATURES:

- Output power up to +30 dBm
- 127 dB of attenuation; 1 dB step size (optional 0.1 dB step size)
- Highly customizable to fit a variety of design needs

RTP5000 Real-Time Peak Power Sensors to 40 GHz

The RTP5000 Real-Time Peak USB Power Sensors address challenges faced by engineers and technicians who design, verify, and maintain systems utilizing pulsed signals. The sensors incorporate Real-Time Power Processing™ and offer faster rise times; better time resolution; the fastest measurements; and a simple, intuitive, and powerful graphical user interface.

KEY SPECIFICATIONS AND FEATURES:

- Accurate pulse measurements
- VBW: 195 MHz; rise time: 3 ns; time resolution: 100 ps; 100,000 measurements/s
- Crest factor, CCDF, and statistical measurements
- Synchronized multi-channel measurements

PMX40 RF Power Meter

The PMX40, compatible with RTP5000 and RTP4000 series power sensors, provides design engineers and technicians with the utility of a traditional benchtop instrument, the flexibility and performance of modern USB RF power sensors, and the simplicity of a multi-touch display.

KEY SPECIFICATIONS AND FEATURES:

- Capture/display/analyze peak and average power
- Synchronous multi-channel measurements (up to 4 channels)
- Sensors can be used as standalone instruments

More Resources

Visit info.maurymw.com/mapcon-2024 to learn more about Maury Microwave solutions.